REMARKS

Claims 2-4 and 9-22 are all the claims pending in the application. Claims 13-15 and 18 have been amended for purposes of clarity.

Applicants respectfully submit that with the entry of the proposed amendments, the present application will be in condition for allowance.

Entry of the above amendments is respectfully requested.

I. Rejection of Claims 2-4 and 9-22 under 35 U.S.C. § 112, second paragraph

On pages 2-3 of the Office Action, claims 2-4 and 9-22 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserts the following.

A. At least claims 10, 11, 12, 16 and 17 remain confusing in that nature of "an optical isomer II" is not clearly defined. Is "the isomer" intended?

Applicants respond as follows.

Since the amino acid of formula (1) has a chiral carbon, there are two isomers (L-form and D-form) of the amino acid. Therefore, the "I" and "II" are used to distinguish the two optical isomers. Accordingly, a first optical isomer (optical isomer I) is reacted with a biological material and converted to a second isomer (optical isomer II).

It is respectfully submitted that one of skill in the art would understand the meaning and scope of the claims.

B. The claims are vague, indefinite and confusing in that it is unclear what is intended to be encompassed by "reacting a biological material which has **an** ability of converting". The nature of the "biological activity" is not identified and it is unclear what constitutes "an ability" in this context. It is "the" ability?

Applicants respond as follows.

To more positively recite that a reaction occurs, Applicants have amended the claims by replacing "has an ability of converting" with --converts--.

C. The claims fail to find proper antecedent basis for "said optical isomer I". The isomer appears to be designated "1". The claims remain confusing because of the inconsistent recitation (I) and (1).

Applicants respond as follows.

It is respectfully submitted that upon review of the claims, it appears that the claims were amended to correct the inconsistent recitation of (I) and (1) in the Amendment filed on October 25, 2002.

D. The process of claim 18 remains confusing because it lacks a recovery step and in that the nature of the process remains unclear. The claim is rendered indefinite by the use of a word of degree such as "increased" as a limitation, i.e., the extent and manner of increase in the optical purity in this process is not set forth with sufficient particularity. In addition, the Examiner asserts that claims 13-15 remain vague, indefinite and confusing in that the nature of the "improved" optical purity cannot be determined.

Applicants have amended claim 18 by inserting --and isolating said optical isomer II-- at the end of the claim to recite a recovery step.

With respect to the phrase "increased" and "improving", the Examiner asserts that the specification does not enable one skilled in the art to reasonably establish what may be construed as being within the metes and bounds of the word of degree. Therefore, one skilled in the art would not be apprised as to the claimed invention's

scope when the claims are read in light of the specification.

As noted previously, claims 13-15 and 18 are directed to methods of reacting a biological material with an isomer of an amino acid or to a mixture containing isomers of an amino acid and converting one of the isomers to the other. As a result, if the amount of the desired isomer is increased, and the optical purity of the resulting isomer is increased or improved. *See e.g.,* Examples 1, 2 and 3. For example, if a racemic mixture is used, and isomer I is converted to isomer II so that there is more of isomer II, then the optical purity of isomer II has increased or improved. In addition, Applicants have amended claims 13-15 and 18 to more clearly define the present invention.

Therefore, it is respectfully submitted that one of ordinary skill in the art would understand the meaning and scope of the claims.

E. In claims 13-15 the antecedent basis of the phrase "wherein the mixture is not a racemic mixture" is unclear. Is it the original mixture or the mixture produced?

Applicants respond as follows.

Initially, it is noted that claim 18 appears to be the only claim containing the phrase "wherein the mixture is not a racemic mixture", which refers to the original mixture. Therefore, Applicants have amended claim 18 by inserting the phrase "wherein the mixture is not a racemic mixture" after "optical isomer I and said optical isomer II" at line 8 of claim 18 for purposes of clarity.

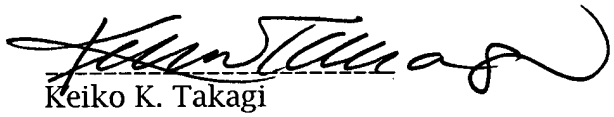
In view of the above remarks and amendments, withdrawal of the foregoing rejections is respectfully requested.

II. Conclusion

Reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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Date: March 18, 2003

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been changed as follows.

10. (twice amended) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [has an ability of converting] converts said optical isomer I to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine,

wherein said biological material is one obtained from a microorganism belonging to the genus *Arthrobacter*, *Klebsiella*, *Nocardia*, *Rhizobium*, *Saccharopolyspora* or *Streptomyces*, and isolating an optical isomer II.

11. (twice amended) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [has an ability of converting] converts said optical isomer I to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine,

wherein said biological material is one obtained from a microorganism classified to *Arthrobacter pascens*, *Flavimonas oryzihabitans*, *Klebsiella planticola*, *Nocardia diaphanozonaria*, *Pseudomonas chlororaphis*, *Pseudomonas oleovorans*, *Pseudomonas oxalaticus*, *Pseudomonas taetrolens*, *Rhizobium meliloti*, *Saccharopolyspora hirsuta* or *Streptomyces roseus*, and isolating said optical isomer II.

12. (twice amended) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [has an ability of converting] converts said optical isomer I to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine,

wherein said biological material is one obtained from *Arthrobacter pascens* strain IFO12139, *Flavimonas oryzihabitans* strain JCM2952, *Klebsiella planticola* strain JCM7251, *Nocardia diaphanozonaria* strain JCM3208, *Pseudomonas chlororaphis* strain IFO3521, *Pseudomonas oleovorans* strain IFO13583, *Pseudomonas oxalaticus* strain IFO13593, *Pseudomonas taetrolens* strain IFO3460, *Rhizobium meliloti* strain IFO14782, *Saccharopolyspora hirsuta subsp.kobensis* strain JCM9109 or *Streptomyces roseus* strain IFO12818, and isolating said optical isomer II.

13. (twice amended) A method for improving the optical purity of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said amino acid represented by Formula (1), wherein said biological activity [has an ability of converting] converts an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine,

wherein said biological material is one obtained from a microorganism belonging to the genus *Arthrobacter*, *Klebsiella*, *Nocardia*, *Rhizobium*, *Saccharopolyspora* or *Streptomyces*,

whereby the optical purity of the optically active amino acid is higher than the optical purity of the optically active amino acid prior to said reaction with a biological material.

14. (twice amended) A method for improving the optical purity of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said amino acid represented by Formula (1), wherein said biological material [has an ability of converting] converts an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine,

wherein said biological material is one obtained from a microorganism classified to *Arthrobacter pascens*, *Flavimonas oryzihabitans*, *Klebsiella planticola*, *Nocardia diaphanozonaria*, *Pseudomonas chlororaphis*, *Pseudomonas oleovorans*, *Pseudomonas oxalaticus*, *Pseudomonas taetrolens*, *Rhizobium meliloti*, *Saccharopolyspora hirsuta* or *Streptomyces roseus*,

whereby the optical purity of the optically active amino acid is higher than the optical purity of the optically active amino acid prior to said reaction with a biological

material.

15. (twice amended) A method for improving the optical purity of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said amino acid represented by Formula (1), wherein said biological material [has an ability of converting] converts an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine,

wherein said biological material is one obtained from *Arthrobacter pascens* strain IFO12139, *Flavimonas oryzihabitans* strain JCM2952, *Klebsiella planticola* strain JCM7251, *Nocardia diaphanozonaria* strain JCM3208, *Pseudomonas chlororaphis* strain IFO3521, *Pseudomonas oleovorans* strain IFO13583, *Pseudomonas oxalaticus* strain IFO13593, *Pseudomonas taetrolens* strain IFO3460, *Rhizobium meliloti* strain IFO14782, *Saccharopolyspora hirsuta subsp.kobensis* strain JCM9109 or *Streptomyces roseus* strain IFO12818,

whereby the optical purity of the optically active amino acid is higher than the optical purity of the optically active amino acid prior to said reaction with a biological

material.

16. (twice amended) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with a racemic mixture of said optical isomers I and II, wherein said biological material [has an ability of converting] converts an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, and isolating said optical isomer II.

17. (twice amended) A method for producing an optically active isomer II from an optical isomer I of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [has an ability of converting] converts said optical isomer I of said amino acid to said optically active isomer II, the isomerism being on

the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, and isolating said optically active isomer II.

18. (twice amended) A method for [producing] increasing the optical purity of an optically active amino acid [having increased optical purity] composition with respect to an optical isomer II of an amino acid represented by Formula (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with [a] an optically active amino acid composition comprising a mixture of an optical isomer I and said optical isomer II, wherein said biological material [has an ability of converting] converts said optical isomer I of said amino acid to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said [ability] conversion being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [wherein the mixture is not a racemic mixture] and isolating said optical isomer II,

whereby the optical purity of the optically active amino acid composition is higher than the optical purity of the optically active amino acid composition prior to said reaction with a biological material.